



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,889	03/01/2004	Mary Morabito O'Neill	03W124	2628
7590 02/18/2010				
Raytheon Company Intellectual Property & Licensing, EO/E04/N119 2000 East El Segundo Boulevard P. O. Box 902 El Segundo, CA 90245				
EXAMINER				
WYATT, KEVIN S				
ART UNIT		PAPER NUMBER		
2878				
MAIL DATE		DELIVERY MODE		
02/18/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/790,889

Applicant(s)

O'NEILL ET AL.

Examiner

Kevin Wyatt

Art Unit

2878

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-12, 16 and 18 is/are allowed.
- 6) ☒ Claim(s) 13, 15, 17, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office Action is in response to the Amendment after non-final and remarks filed on 11/05/2009. Currently, claims 1-21 are pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Jackson (U.S. Patent No. 5,438,366).

Regarding claim 13, Jackson shows in Figs. 1-3 and 7B-C an imaging sensor system comprising an optics system (conical filter (24) and lens (16)) that images a point feature (point source) of a scene at an image plane (11) as a blur-circle image (31, i.e., circular blur pattern or 32' i.e., filled blur pattern, 11b, i.e., annular blur spot (11b)) having a blur diameter; and a detector array (18, i.e., image sensor) at the image plane (11), wherein the detector array (18) is a two-dimensional detector array comprising a plurality of detector subelements (20, i.e., photosites), and wherein the detector subelements (20) are sized responsive to the blur diameter (lens (16) and filter (24) are prearranged and set in place to produce a blur circle at a size that fits to col. 4, lines 36-41).

Regarding claim 14, Jackson shows in Figs. 1-3 wherein the detector

subelements are square in plan view.

Regarding claim 15, Jackson shows in Fig. 1-3 wherein the detector subelements are rectangular (rectangular subelements having four equal sides) in plan view.

4. Claims 17 and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Vock (U.S. Patent No. 6,320,173 B1).

Regarding claim 17, Vock discloses a method for locating a position of a feature in a scene, comprising the steps of forming an image of the feature using a segmented array having a plurality of array subelements, wherein each of the array subelements has an output signal (col. 3, 13-25 and col. 7, lines 33-40); and cooperatively analyzing (via onboard processor within the card, col. 3, lines 13-17) the output signals from at least two spatially adjacent array subelements to establish a data set (frames of image data) reflective of an extent to which output signals responsive to the image of the feature (received by the frame grabber) are produced from exactly one or from more than one of the adjacent array subelements, and to reach a conclusion from the data set as to a location of the image (performed during analyzing composite image) of the feature on the segmented array (col. 3, 13-25 and col. 7, lines 33-40).

Regarding claim 19, Vock shows in Figs. 2, 4-6, wherein the step of providing a sensor includes the step of providing a two-dimensional segmented array formed of a pattern of intersecting array subelements.

Regarding claim 20, Vock shows in Figs. 6A-B wherein the step of providing a sensor includes the step of providing a two-dimensional segmented array (132, 140 or 150) having a plurality of square array subelements, wherein four of the square array

subelements meet at an intersection point, and wherein each of the array subelements has an output signal (col. 7, lines 33-40).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (U.S. Patent No. 5,438,366) in view of Watanabe (U.S. Patent No. 6,522,356 B1).

Regarding claim 21, Jackson discloses the claimed invention as stated above. Jackson does not disclose wherein each detector subelement overlaps each of two adjacent detector subelements along their lengths by an amount that is responsive to the blur diameter. Watanabe shows in Figs. 1A-C, 3A, 4A and 5A wherein each detector subelement overlaps each of two adjacent detector subelements along their lengths. Furthermore adopting a structure such as Watanabe would provide an arrangement of detector subelements having overlaps along their lengths responsive to the blur diameter. It would have been obvious to one skilled in the art to provide an arrangement of detector subelements such as disclosed in Watanabe to the device of Jackson for the purpose of improving detector resolution.

Allowable Subject Matter

7. Claims 1-12, 16 and 18 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 1, the prior art fails to disclose or make obvious an imaging sensor system comprising, in addition to the other recited features of the claim, "wherein each detector subelement overlaps each of two adjacent detector subelements along their lengths, wherein an overlap of each of the two adjacent detector subelements is m blur diameters and a center-to-center spacing of each of the two adjacent detector subelements is n blur diameters, and wherein n is equal to about $3m$ and m is equal to about $n_0/2$."

Regarding claim 16, the prior art fails to disclose or make obvious, either singly or in combination, an image sensor system, comprising, in addition to the other recited features of the claim, "wherein the detector array is a two-dimensional detector array, and wherein each detector subelement is rectangular in plan view with a length of n blur diameters, a lengthwise overlap of 1 blur diameter relative to a laterally adjacent detector subelement, and a staggered pattern of detector subelements that repeats every m laterally adjacent rows, where m is a positive integer."

Regarding claim 18, the prior art fails to disclose or make obvious, either singly or in combination, a method for locating a position of a feature in a scene, comprising, in addition to the other recited features of the claim, "wherein the step of providing a sensor includes the step of providing a one-dimensional segmented array having spatially overlapping array subelements."

Response to Arguments

8. Applicant's arguments filed 11/05/2009 have been fully considered but they are not persuasive.

In response to applicant's arguments regarding claim 13, that the cited portion of Jackson does not disclose the recited limitation "the detector subelements are sized responsive to the blur diameter", that there is no disclosure that the size of the photosites is changed responsive to the blur diameter", the examiner disagrees with applicants interpretation of the cited passage. The argument provided on page 8 of applicant's remarks is not commensurate with the scope of the claim limitation. There are no limits on the size of the detector subelements in relation to the blur diameter recited in claim 13. Therefore the detector subelements (photosites) in Jackson are responsive to the blur circle regardless of whether the photosites are greater than, less than or equal to the blur circle imaged. In addition, there are no limitations in claim 13 that recite changing the size of the photosites (from a predetermined size) in response to a blur diameter as suggested in applicant's remarks on lines 11-12 of page 8. There appears to be nothing supporting the disclosure of Figs. 1 and 2 of Jackson to indicate that both lens (16) and filter (24) are intended to be movable. In addition, the size of the detector subelements are predetermined during the manufacture of the device so that the detector subelements deliver the proper response to the blur circle applied to the imager. Since the detector subelements provide the appropriate response (as designed by Jackson) to the blur circle, the subelements therefore would have to meet the above limitation recited in claim 13. Regarding col. 4, lines 36-41 in Jackson, Fig. 1, indicates

the geometrical arrangement to be related to the size of central region (36) of the blur circle which may possibly be variable. However, the cited passage clearly indicates that the geometry is chosen such that blur pattern (31) equally covers four adjacent photosites and is intended to remain constant. Therefore, blur pattern (31) provides the same diameter regardless of the size of central region (36). For example an annular ring having a size equal to a filled circle will also have a diameter equal to the same filled circle.

In response to applicant's arguments regarding claim 17 that Vock does not discuss how the digital electronics work nor analysis of information nor, cooperative analysis of the output signals, the examiner disagrees. As provided in the previous office action, col. 7, lines 33-40 clearly indicate the functioning of the digital electronics of Vock within the solid state camera. It states that "sensor 18a includes a solid state camera and certain electronics to interpret, track and/or detect golf ball locations within the range". Therefore the electronics within sensor 18a designed to interpret, track and/or detect golf ball locations performs the analysis of information and cooperative analysis of the output signals. Thus Vock fully discloses all of the limitations of claim 17.

In response to applicant's arguments regarding claim 20 that Vock that there is no disclosure in Vock of blur diameters of one blur diameter, or any concept of blur diameter, which could arguably be said to teach the limitations of claim 20, that there is no mention of a blur diameter related to the apparent size on the detector of a point in the scene, the applicant is urged to read col. 9, lines 54-67 and col. 10, lines 1-8, where Vock refers to element 73 in Fig. 4 as an optical blur and a blur spot. Vock clearly states

in col. 9, lines 61-63 that from aperture "D" blur spot (73) is formed for each point in the object field. In addition, col. 10, lines 1-9 clearly indicate the relationship of blur spot (73) with respect to the detector elements' size and dimensions. Therefore at least col. 9, lines 54-67 and col. 10, lines 1-8, in Vock adequately disclose the limitations is claim 20 relating to a blur diameter.

In response to applicant's arguments regarding claim 21, the examiner submits that the statement of rejection for the previous office action was intended to provide Watanabe (U.S. Patent No. 6,522,356 B1) instead of Vock (U.S. Patent No. 6,320,173 B1). However, Watanabe is provided in the body of the rejection, referring to the same figures (Figs. 1A-C, 3A, 4A and 5A) as the rejection of claim 15, immediately proceeding the rejection of claim 21. The examiner apologizes for the apparent misunderstanding. However, in the interest of expediting prosecution on this case, the applicant is always welcome to contact the examiner at the phone number provided on the office action to promptly resolve any minor issues regarding the claim rejections.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571)-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. W./
Examiner, Art Unit 2878

/Georgia Y Epps/
Supervisory Patent Examiner, Art Unit 2878